

CLAIMS

What is claimed is:

1. A transportable localization system for use in an environment, comprising:
 - (a) a plurality of information devices, each information device having an information code, passively communicating said information code, and being placed at a predetermined location;
 - (b) a receiver, for receiving a communication of said information code;
 - (c) a first memory, storing a plurality of communicated information codes;
 - (d) a second memory, storing a map relating, for the plurality of information devices, a location of an information device with said information code of the information device;
 - (e) an analyzer, for determining, based on the information in said first memory and said information in said second memory, a path of locations of said receiver through the environment.
2. The localization system according to claim 1, wherein said information devices each comprise a radio frequency identification transponder.
3. The localization system according to claim 2, wherein said radio frequency identification transponders comprise passive backscatter transponders.
4. The localization system according to claim 3, wherein said passive backscatter radio frequency identification transponders comprise surface acoustic wave devices.
5. The localization system according to claim 1, wherein at least two information devices within the environment have the same information code.
6. The localization system according to claim 1, wherein said analyzer provides an error tolerant algorithm for determining a location of the receiver in the event that one or more errors of the following types occur: said predetermined location is altered, said receiver receives an erroneous information code, said receiver misreceives said information code, and said map is erroneous.

7. A localization system, comprising:

(a) a receiver, adapted for receiving information content signals from nearby devices having predetermined locations, the information signal from any device having an information content insufficient to uniquely identify that device, said devices being distributed in a non-sequential fashion with respect to a relation between respective information content signals and device position; and

(b) an analyzer, for analyzing a plurality of information content signals received in temporal proximity, with respect to stored representations of locations and respective corresponding device information content, and outputting a probable location of said receiver.

8. The localization system according to claim 7, wherein said information devices each comprise a radio frequency identification transponder.

9. The localization system according to claim 8, wherein said radio frequency identification transponders comprise passive backscatter transponders.

10. The localization system according to claim 9, wherein said passive backscatter radio frequency identification transponders comprise surface acoustic wave devices.

11. The localization system according to claim 7, wherein at least two information devices within the environment have the same information code.

12. A localization system comprising:

an information device reader;

a memory for storing mapping information;

a memory for storing sets of proximate information device codes received by the reader;

and

a search engine, for searching the stored mapping information for map regions consistent with the sets of proximate information codes.

13. The localization system according to claim 12, wherein said information device reader comprises a radio frequency backscatter interrogation system.

14. The localization system according to claim 12, wherein at least two information devices within the environment have the same information code.

15. The localization system according to claim 1, wherein said search engine computes a correlation of sets of the stored mapping information and the sets of proximate information codes to determine consistent locations in fault tolerant manner.

16. An environmental location system, comprising:
a distributed set of information devices, each device having a non-unique code, said devices having said codes being distributed having a pseudorandom or random relation of device code and respective device location in the environment space; and
a medium, storing position information for the distributed set of information devices in conjunction with a respective non-unique code.

17. The environmental location system according to claim 16, further comprising a processor for calculating a potential ambiguity factor in a localization based on a predetermined computational criteria, and producing an indication of a disallowed location of an information device having a particular information code in an event of said calculated potential ambiguity factor.

18. A data storage medium, storing thereon mapping information describing identification codes of a distributed set of information devices in conjunction with position information therefore.

19. The data storage medium according to claim 18, wherein said position information has an accuracy of between about 10 centimeters to about 100 meters.

20. The data storage medium according to claim 18, wherein at least two information devices within the environment have the same information code.

21. A method for determining a location, comprising:
dispersing through an environment space a set of encoded information devices, each having an ambiguous encoding, in a random or pseudorandom pattern;
storing a mapping of codes for encoded information devices in conjunction with a location thereof in the environment space;
receiving codes from a set of proximately disposed information devices; and
searching the mapping to identify a location having consistent set of proximate information devices.

22. The location determining method according to claim 21, further comprising the steps of, before permanently dispersing one of said encoded information devices, calculating a potential mapping ambiguity of a position of that information device, based on a predetermined computational criteria, and producing an indication of a disallowed location of an information device having a particular information code in an event of said potential ambiguity.

23. The location determining method according to claim 21, wherein said set of encoded information devices comprise passive backscatter radio frequency identification transponders.

24. The location determining method according to claim 21, further comprising the steps of determining a position using a secondary positioning system having characteristics differing from the set of encoded information devices; and
processing the location and the position together.

26. A passive radio frequency transponder comprising a module having a housing, said housing having an optically retroreflective portion thereof, a radio frequency antenna system within the housing, and a passive radio frequency transponder element, receiving a radio signal

through the antenna system and transmitting a modified radio frequency signal through the antenna system.